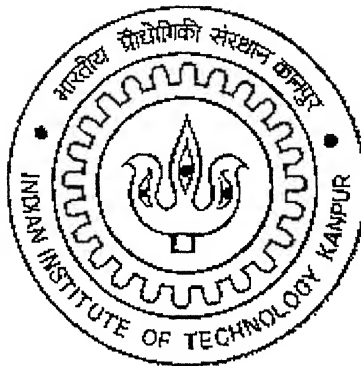# EVALUATION, RATING & CERTIFICATION

OF

ONLINE DOCUMENT

A Thesis Submitted
In Partial Fulfillment of the Requirements
for the Degree of

MASTER OF TECHNOLOGY

By

Mayank

DEPARTMENT OF INDUSTRIAL &MANAGEMENT ENGINEERING
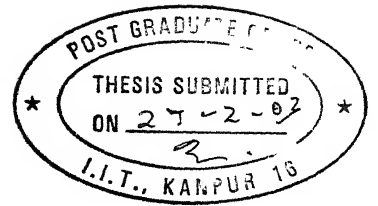# INDIAN INSTITUTE O F TECHNOLOGY
KANPUR - 208016 (INDIA)

CERTIFICATE

It is certified that the work contained in the thesis entitled, *"Evaluation, Rating & Certification of Online Document"* by Mayank has been carried out under my supervision and that this work has not been submitted elsewhere for a degree.

27 February 2003

(Dr. Veena Bansal)
Assistant Professor
Industrial and Management Engineering
Indian Institute of Technology, Kanpur.

ACKNOWLEDGEMENT

At the very outset, I would like to express deep gratitude to my supervisor Dr. Veena Bansal. Her invaluable guidance and encouragement throughout the endeavor propelled me despite of my inability. She continues to encourage me through her valuable suggestions. I will always be grateful for her for the interest she has shown in my research.

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I thank to staff of central library. IME department, Hall-IV for all the help they had extended during my stay at IITK. I thank all my friends in IITK for making my stay memorable. I am always grateful to all my family members for love and support they had given me during the tough periods

FEBRUARY 2003   Mayank

ABSTRACT

Information available on the web is enormous. It needs to be useful for a given purpose to have value. Anyone can compose Web pages, documents of widest range of ideas and widest range of quality. A system is expected to measure the quality of information for a given context. Quality in this case, constituted largely by relevance.

The present dissertation focuses on the quality of information available on web. It deals with the Evaluation, Rating & Certification (ERC) of online document. An institution, IERC that conducts the Evaluation, Rating & Certification of online documents, is devised.

Planing of institute includes the development of institute infrastructure, operations and processes involved in ERC of online/web document. It discusses evaluation and rating method required for a document to certify its rating. A web directory service and search engine service working with IERC is envisioned. Infrastructure needs for IERC and their costs are analyzed. To ensure appropriate use of certificate required control over certified documents, is also discussed.

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The World Wide Web offers information and data from all over the world. Because so much information is available, and because that information can appear to be fairly "anonymous", it is necessary to develop a system to evaluate what we find. When we use a research or academic library, the books, scholars, publishers and librarians have already evaluated journals and other resources. Every resource we find has been evaluated in one way or another before we ever see it. When we are using the World Wide Web, none of this applies. Because anyone can compose Web page, documents of widest range of ideas and widest range of quality.

If a document is evaluated for its quality level, rated on an unbiased platform, and certified by an authority then it would hardly happen that excellent information reside along side the most dubious.

The search engines let a user select the documents of *his choice*. The last two words are in italics not by accident or to mean his/her for his, but to emphasize the word choice. One can give any dictionary word as search field in any search engine and the number of documents chosen are over one million. Different search engines have different mechanism for choosing the relevant documents and each one has its own claims. For instance, Google interprets a link from page A to page B as a vote, by page A, for page B. They claim, Google looks at more than the sheer volume of votes, or links a page receives; it also analyzes the page that casts the vote. Votes cast by pages that are themselves "important" weigh more heavily and help to make other pages "important." In this paper, we argue that the present strategies are not effective and we present a framework for our strategy that is based on "old is gold philosophy".

In the present Context, "Evaluation, Rating & Certification of Online Document", certification assures that the Web sites/documents have been evaluated and rated against meaningful standards by an authority. They have mastered a body of knowledge in their area, been tested and earned the right to be recognized in their field.

1.1   Web Document

Resources available on Internet are unlimited, prominent forms are websites, software, music, business etc. Each one can be rated and certified in their own domain. *Web documents* are prime focus in Evaluation, rating & certification (ERC) system.

Web Document:

A document, which contains information, organised in *Title* and then in *Content*, is a web document. A paragraph about a famous personality can be a web document. A web page is a web document if it has an explicit title around which the body of the page is organised. Title of a web document is not to be confused with the *title tag* of the web page [Appendix A]. Title of the web page may be altogether different from the title of the web document. A web page title may give crude idea about the content but exact details are disclosed by the title of the web document.

It hardly happens that both the titles narrate same information. In the following example, the web page title is "*Organization*" but the title of web document is "*How This Web is Organized*" [Figure 1.1]. However, from the knowledge perspective, it is title of web document that makes the web document eligible for evaluation and rating.

1.2   Evaluation, Rating & Certification - Standards

There are various standards on which web document can be evaluated, for rating and certification. Objective of evaluation and rating should be based on the standard that makes the web document worthy. Every web document has its own realm, many belongs to business, many to sports, and many to Science. All documents have information as content, more or less relevant to title.

The quality of a document is stated by its content. But content alone can't be stated as a standard feature to evaluate and rate a web document. Content of a web document

should adhere to its title, if the title and content of a web document speak differently then the quality of the document will be low. Title and content both are needed together to rate a document.

Organization - Microsoft Internet Explorer

File Edit View Go Favorites Help

Back | Forward | Stop | Refresh | Home | Search | Favorites | History | Channels | Fullscreen | Mail | Print | Edit

Address C:\WINDOWS\Desktop\May's\Mayank\Basis.htm

Title, web document

How This Web is Organized

This web explores the radical potential of the MOO as a new and dynamic pedagogical reality, but from the perspective of design and administration. In essence, the MOO is host to both micro-communities (individual classes) and macro-communities (research collectives), and the best way to insure the smooth integration of all the teaching features with research features is to blur the boundaries between the two in terms of design and administration.

The links provided through this web will lend support to that aim. Each link sends the reader to different discussions related to Lingua MOO and writing instruction, to various points of interest, and specially programmed features at Lingua that enhance pedagogical methods for writing teachers. Most of the links will allow the reader to return to the 'start page' though some are external links to outside resources, and a few take the reader directly to our web interface (in which case, to return to this web you will need to click on your back button or command your web browser to return backward). Finally, the web will help redefine the space of learning by weaving together teaching and research into one seamless pedagogical reality.

Content, web document

Back to the start page

Start | My Computer | Organiza... | Intro to Inte...

A good quality document should give the affirmative answers to following:

Is content valid and relevant to title?

Is document self-contained?

Links are relevant and working?

ERC system is designed to ascertain answers to these questions.

1.3 Benefits

Following benefits are attained by ERC of web documents:

- ERC will make the Web Site/Document more trustworthy and consistent.
- If search engines are combined with ERC system, search engines will produce more focused result.
- Browsing within a Web Site/Document will be fast due to high Content-Title relevancy.

1.4 Public opinion

A survey was conducted to gather the view of web community about ERC of Web Site/Document(s). Survey was conducted in September 2002 and 60 people gave their opinion. The survey was addressed to frequent users of web documents and search engine services. Population comprised of students and faculty members. Following results were obtained from analysis:

Q1) Web Sites/Documents should be Evaluated, Rated and Certified:

Q1

☐ 14%

🮕 Yes ■ No ☐ Can't Say
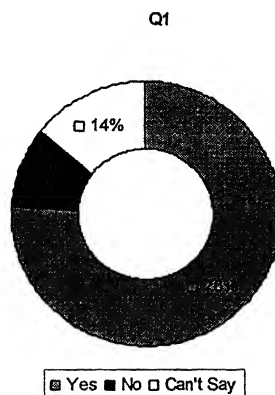
Q2) ERC system should be based on "Title-Content-Relevance" criterion, instead of presentation, downloading ease and number of hits etc.

Q2

□ 14%

Yes ■ No □ Can't Say
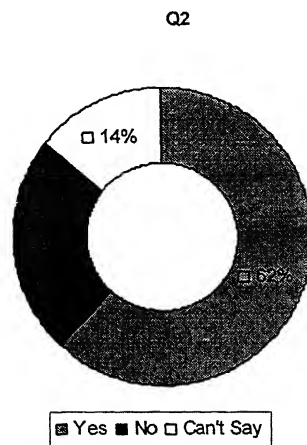
Q3) If search engines are combined with ERC system, search engines will produce more focused results

Q3

□ 10%

Yes ■ No □ Can't Say
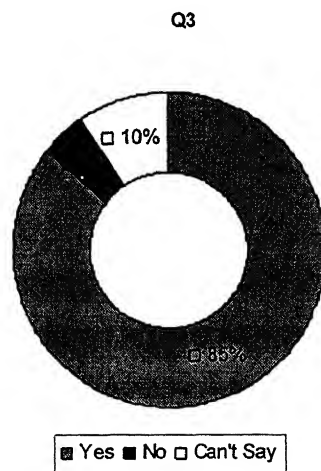
Q4) Advertisements found on site are distracting and irrelevant to Title.

Q4

□ 19%

Yes ■ No □ Can't Say
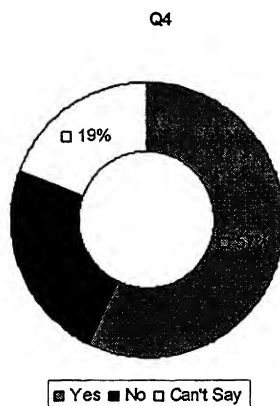
Q5) Currently the "Title-Content Relevance" level is.

Q5

Good   Satisfactory   Un-satisfactory
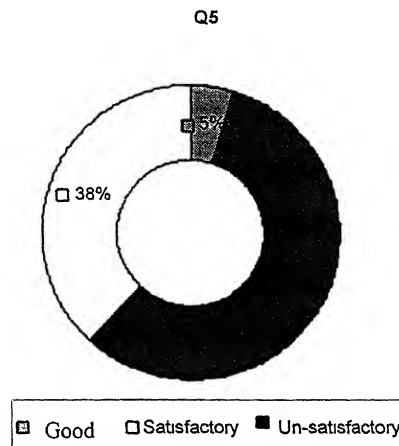
1.5   Present scenario

There are many organisations, which offer web sites rating services. The rating is based mainly on popularity, outlook and listing of web sites in top search engines. Prevalent rating systems rate the web site but quality of information is hardly rated. There is no basis to rate the quality of content and title in a Web Site/Document. Quality of information provided at sites is usually overlooked by technology, used in making web page impressive.

Most of the organizations run a voluntary self-rating system which provides internet users world wide with the choice to limit access to content they consider harmful, especially to children [1]. Many systems focuses on protecting children form accessing adult material [Appendix B] and pornography [2].

To best of our knowledge, no service is available to measure the quality of information available on web. Proposed *Institute for Evaluation, Rating & Certification* (IERC) focuses primarily on web documents, but it also considers the supporting web material that is necessary to make the web document available on the web like hyperlinks, advertisements etc.

2.1   Certifying Institute

The Evaluation, Rating & Certification system is voluntary and aims at maintaining quality, reliability and worthiness of the Web Site/Document. Presence of high rating - certification mark on a Web Site/Document is an assurance of its high quality and conformity of content to title.

Institute for Evaluation, Rating & Certification (IERC)

The Evaluation, Rating and Certification system requires a true trusted infrastructure and a trusted authority or organization. The infrastructure will have certificate authority service including registration and issuance of certificate, which will be supported by individuals who will participate in evaluation, and rating the Web Site/Document. Infrastructure will include a repository for certificate and Web Sites/Documents, so that they may be retrieved on authorized demand. Infrastructure will support policies to authenticate the certificate-users so that any forgery is prevented.

2.2   Certification Process

Process of Evaluation, Rating & Certification may be viewed in two perspectives, for an applicant and for the organization member. Applicants who want to get their Web Site/Document certified may submit it online at the Certifying Institution's site. This request is forwarded to Experts for review. After Evaluation rating from experts, certificates are issued to pertaining Web Site/Document. [Figure 2.1]

For the organisation member the phases involved in ERC system are:

1) Application

Web Sites/Documents are submitted online at institute's web site and registration is completed in this phase [Section 2.2.1 & 2.2.3]

2) Document and Experts Database Search

On the basis of details provided by applicant, a search is made in the database to locate the similar Web Site/Document. If a *similar* document is found,
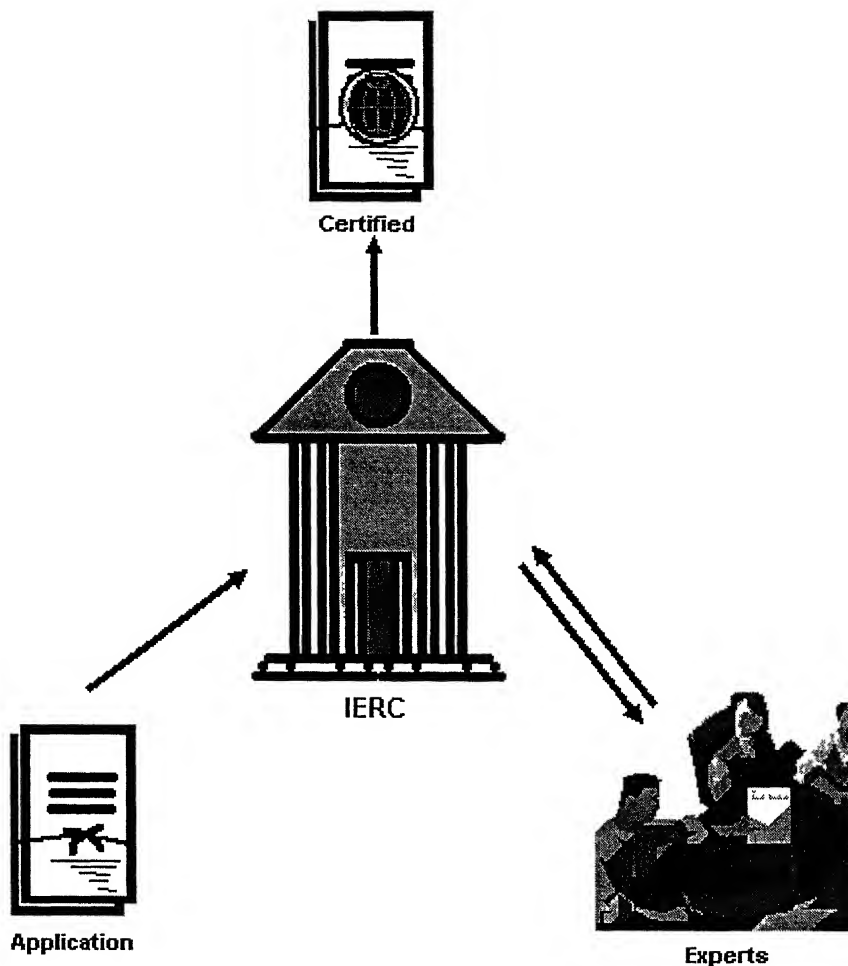
Figure 2.1: Certification Process

experts/reviewers of the old Web Site/Document are contacted for new application also. [Section 2.2.6]

Similar document:

If two or more web documents have same *area*, *topic* and *subtopic* (sometimes *title* also), then these documents are called similar documents. [Appendix C]

Area:

It is the domain of a web document:

e.g. Automobiles

Topic:

It is the field in that area:

Automobiles>diesel engines

Subtopic:

This makes the topic more specific:

*Automobiles>diesel engine>**Ignition***

Title:

This is the title or heading of the web document:

*Automobiles>diesel engine>Ignition>**Effects of ignition delay in a diesel engine.***

If a similar Web Site/Document doesn't exist in the document database, expert database is searched. Details of experts of the same sub topic as of Web Site/Document are retrieved and they are contacted for review.

3) Evaluation, Rating and Certification

This part is conducted by a team of experts, rights of certification and rating lie with Institute and expert's team. [Section 3.1 & 3.2]

4) Certification

After approval, a certificate is issued to the concerned Web Site/Document. This certification is valid only for a pre-specified time period, after which the certification expires. For renewal of the same, a request is sent to the institution. [Section 3.3]

5) Databases Update

Database, document-part as well as expert-part is updated whenever a certificate is issued. [Section 3.5]

6) Audit and surveillance

This phase strives to keeps vigil on the certified Web Site/Document for changes made after certification.

The conformity of certified Web Site/Document to applied Web Site/Document is ensured by regular surveillance. For this Web Site/Document are inspected by surprise audits and review. [Section 6.3]

2.2.1 Submitting a Document

Web Site/Document are submitted online for Evaluation, Rating and Certification. However there are few pre-requisites which must be full filled by every applicant. This all is done to ensure the parity among all submissions.

Few mandatory inputs from applicant at the time of submission, helps institute for structured Evaluation, Rating and Certification.

2.2.2 Pre-requisites

1) No Web Site/Document(s) of pornographic nature are certified.

2) Websites promoting illegal software, illegal acts, bomb making, anti-government or anti-freedom material, illegal audio files (copyright), unlawful behavior or other illegal content will not be certified.

3) Websites that promote hate, drug abuse, violence, or other inappropriate (as determined by institute) material will not be accepted.

4) After certification if content of the Web Site/Document is changed, certification will become void.

5) Every applicant is required to mention few keywords that best describes the web document.

6) Web document with dynamic content will not be certified.

2.2.3 Mode of Submission

An URL of the Web Site/Document or complete Web Site/Document is submitted at the *Institute for Evaluation, Rating & Certification* (IERC). Following details are to be furnished by the applicant: [Figure 2.2]

Request Type: New [Default] / Old [Previous Certification ID to be filled in a formatted text box]

Area: Applicant has to select the area of his Web Site/Document in a dropdown Combo Box.

File   Edit   View   Go   Favorites   Help

Back   Forward   Stop   Refresh   Home   Search   Favorites   Fullscreen   Mail   Print   Edit

Address   about:blank

Web Site/Document Submission Form

Application Type

○ New Application   ○ Old Application   [Old Application ID]

Web Site/Document Details

Area   [▼]   Area of Document

Topic   [▼]   Topic of Document

Sub Topic   [▼]   Sub Topic of Document

Title   [   ]

Key Words   [   ]

Document Description   [   ]   optional

Applicant Details

Owner/Author   [   ]   Webmaster   [   ]   optional

Email   [   ]

Upload

[Browse]   [   ]

[http://   ]

[Submit]

Figure 2.2: Submitting a Document   11

Topic: Applicant has to select the Topic of his Web Site/Document in a dropdown Combo Box.

Sub Topic: Applicant has to select the Sub Topic of his Web Site/Document in a dropdown Combo Box.

Title of Web Site/Document: Applicant will fill up the Web Site/Document title in the text box.

Key Word: Key words that best describe the document are to be filled in the text box. (This is optional)

Document Description: Description of document is to be filled in the text box. (This is optional)

Name of the Owner/Author: This entry is to be filled in the text box.

Name of the Webmaster: This entry is to be filled in the text box. (This is optional)

Email: Email is to be filled in a formatted text box.

Document can be uploaded from a local computer or URL of the document can also be submitted. When the document is accepted, a confirmation appears instantly. A database application running in the background gives a temporary Document_ID to each applicant. This ID can be used for future referencing till the ERC of submitted document gets complete.

2.2.4 Database

The information required by ERC system is about web documents and experts who review them. Database is maintained to organize this information.

2.2.5 Schema

Entire database can be considered as cluster of Web Sites/Documents-Experts relations. Following fields are covered in different relations:

- Area of the Web Site/Document

AreaMaster
Area_ID
Area_Description

- Topic of the Web Site/Document

TopicMaster
Topic_ID
Area_ID
Topic_Description

- Sub Topic of the Web Site/Document

SubTopicMaster
SubTopic_ID
Topic_ID
SubTopic_Description

- Title of the Web Site/Document

- Owner of Web Site/Document

- Webmaster

- Contact Information

SiteMaster
Site_ID
Site_Title
Site_Description
Area_ID
Owner
IsActive
Webmaster_Name
Contact_Info

A "Master Document" relation keeps track of all the Web Site/Document which are certified. It comprises the following details:

DocumentMaster
Document_ID
Site_ID
Certificate_ID
Document_Title
SubTile_ID
Authors
Creation Date
DocumentURL
IsActive
FileName
FileSize
LanguageID
FolderPath
KeyWords

"Expert's relations" gives details of Experts, their area, contact information and document reviewed by them.

SubTopicExpert
SubTopic_ID
Expert_ID

ExpertMaster
ExpertID
Expert_Name
Expert_Address
Expert_Email

DocumentExpert
Document_ID
Expert_ID

A "Certification Master" relation keeps the track of certificate issue date, expiry date and review details etc.

CertificationMaster
CertificateID
Certificate_Title
Cewrtificate_Description
DateofIssue
LatReviewed
Rating
ReviewCycleID
NextReviewDate
IssuedTo

ReviewCycle
ReviewCycleID
Description
ReviewInterval

Figure 2.3 illustrates the entity-relationship diagram (ERD).

ERD

ReviewCycle
- ReviewCycleID
- Description
- ReviewInterval

AreaMaster
- Area_ID
- Area_Description

TopicMaster
- Topic_ID
- Area_ID
- Topic_Description

SubTopicMaster
- SubTopic_ID
- Topic_ID
- SubTopic_Description

SubTopicExpert
- SubTopic_ID
- Expert_ID

ExpertMaster
- Expert_ID
- Expert_Name
- Expert_Address
- Expert_Email

SiteMaster
- Site_ID
- Document_Description
- Area_ID
- Owner
- Status
- Webmaster_Name
- Contact_Info

DocumentMaster
- Document_ID
- Site_ID
- Certificate_ID
- Document_Title
- SubTopic_ID
- Authors
- Creation Date
- DocumentURL
- Is Active
- FileName
- FileSize
- LanguageID
- FolderPath
- KeyWords

DocumentExpert
- Document_ID
- Expert_ID

LanguageMaster
- LanguageID
- LanguageName

CertificationMaster
- CertificateID
- Certificate_Title
- Cewrtificate_Description
- DateofIssue
- LatReviewed
- Rating
- ReviewCycleID
- NextReviewDate
- IssuedTo
- Is Active
- DateofExpiry

Figure 2.3: Entity Relationship Diagram

2.2.6 Comparing and retrieving information

Whenever a fresh request is made, the Description provided by applicant at the time of Web Site/Document submission are utilized in locating the similar Web Site/Document or expert.

If a new request is made then the AreaMaster relation gives the Area_ID for the Area of Web Site/Document. This Area_ID along with Topic gives the Topic_ID from TopicMaster relation. Now using Sub Topic and Topic_ID, SubTopic _ID is retrieved.
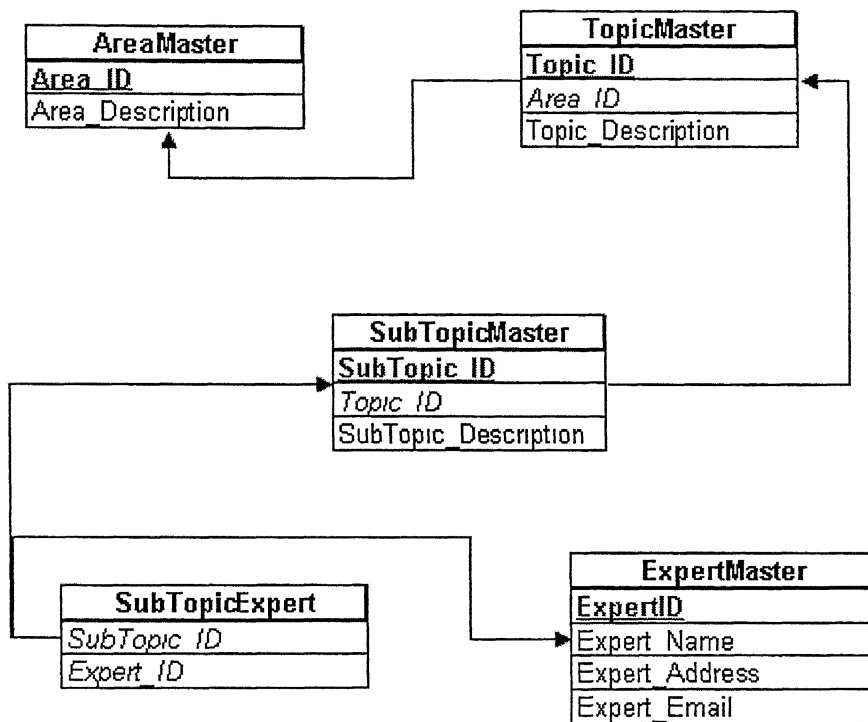
Figure 2.4: Retrieving SubTopic_ID

Area _ID:

Retrieve Area_ID *from* AreaMaster

Where Area_Description = "   "

Topic _ID:

Retrieve Topic_ID *from* TopicMaster

Where Area_ID=" " *and* Area_Description = "   "

SubTopic _ID:

Retrieve SubTopic_ID *from* SubTopicMaster

Where Topic_ID=" " *and* SubTopic_Description = " "

SubTopic_ID plays an important role, as all the details are retrieved through this ID. Once the SubTopic_ID is retrieved the old documents similar to new one, are located. Certification details, experts information and other details of old Web Site/Document are utilized for new document.
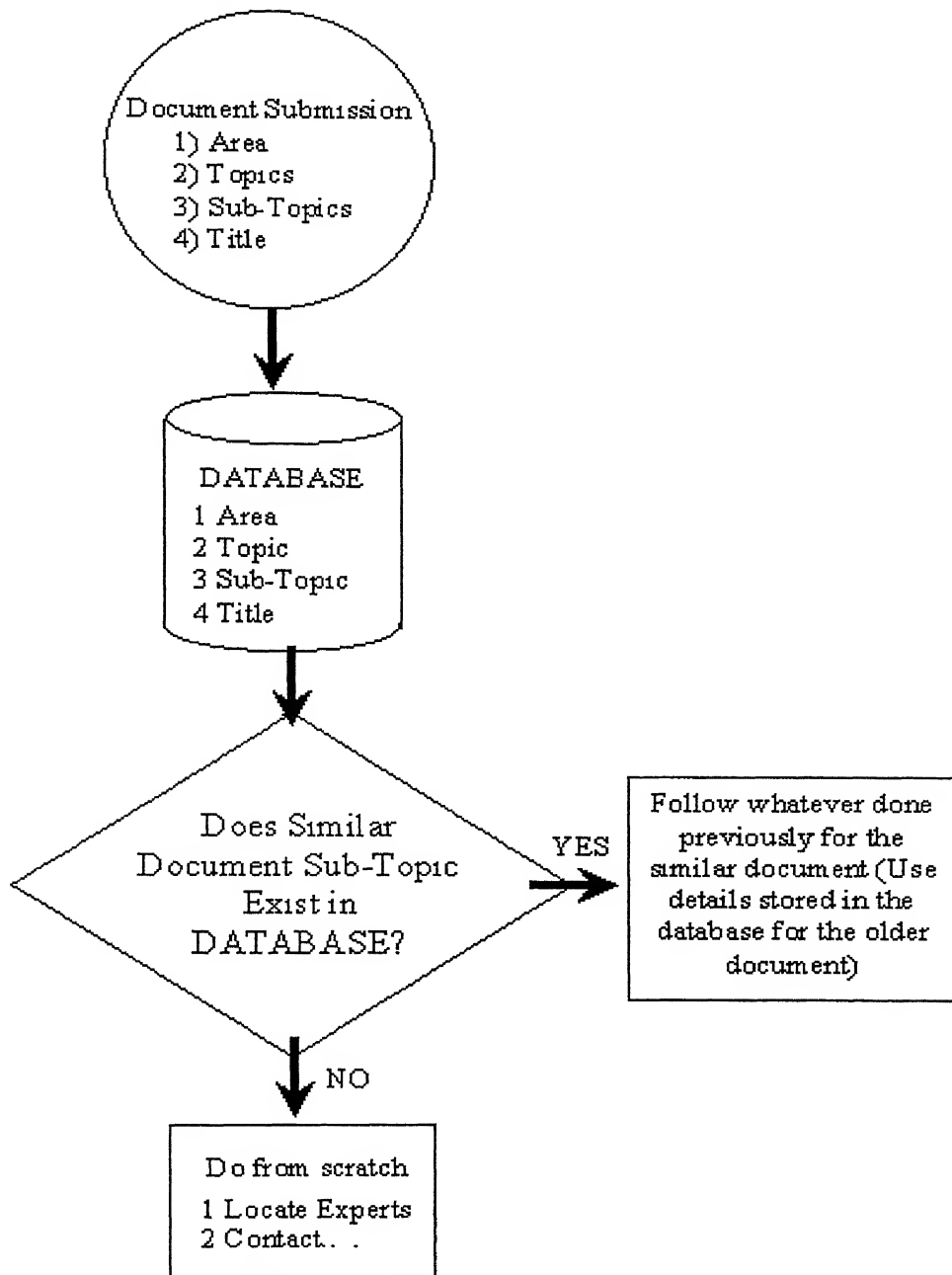
Figure 2.5: Comparing & Locating Similar Document

After SubTopic_ID for a new document is known, database is searched for the documents having similar SubTopic_ID. A similar document found would serve as guide for new document to find who reviewed this type of document and how certification process was carried out. In retrieving the similar document (or document with similar SubTopic_ID) Title of the document and Key words may also be combined as optional *free text search*.

If a similar document does not exist in the database then every thing is carried out from scratch, right form locating the expert.

2.2.7 Document Review

At first instance it looks difficult to arrange experts for document review but number of experts keeps on increasing with the IERC certification. A person, whose document is IERC certified, is eligible to review a similar web document. The owner/author of old IERC certified document is treated as an expert for new similar sub topic document.

Review of the Web Site/Document is the most important task in ERC. It begins with locating an experts of same sub topic. Expert details are retrieved from database. There are different approaches to locate the experts from database who may review the Web Site/Document.

2.2.8 Locating Experts

There are two ways to locate the expert for a web document.
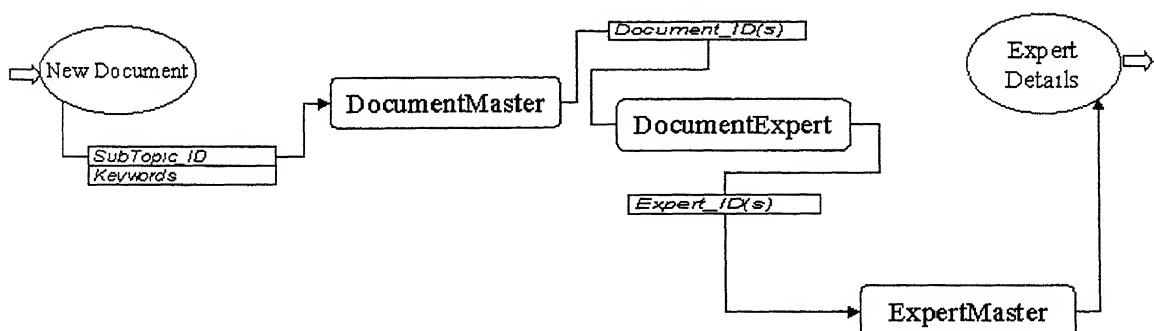
Figure 2.6: Locating Expert(s), Approach 1

Approach 1

This is the first approach and used to retrieve the details of experts who reviewed the similar document.

Experts are located by knowing the SubTopic_ID of the Web Site/Document. Key words along with SubTopic_ID of Web Site/Document are used to find out the Document_ID(s) form the relation DocumentMaster. Expert_ID(s) are fetched now using relation DocumentExpert. After getting Expert_ID(s), ExpertMaster relation is used to find out the expert details using Expert_ID(s) [Figure 2.6].

Retrieve Document_ID *from* DocumentMaster
Where SubTopic_ID = " " *and* Keywords= " "

Retrieve Expert_ID *from* DocumentExpert
Where Document_ID = " "

Retrieve Expert_Details *from* ExpertMaster
Where Expert_ID = " "
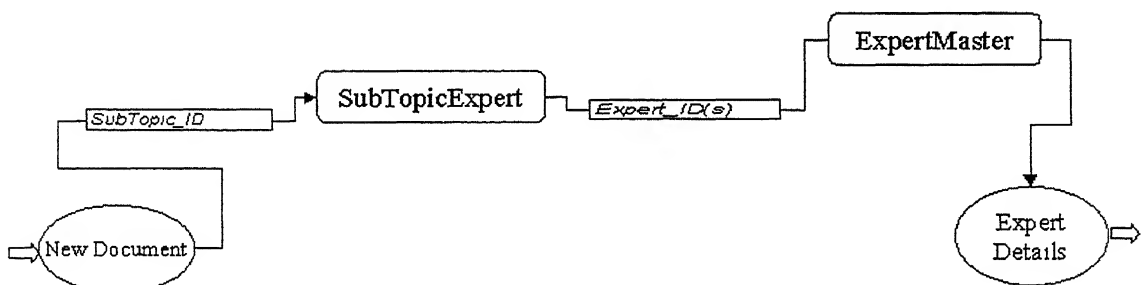
Figure 2.7: Locating Expert(s), Approach 2

Approach 2

If similar document is not found form first approach, then experts that belong to same subtopic are located.

SubTopic_ID of Web Site/Document is used to find out the Expert_ID(s) form the relation SubTopicExpert. Expert details are fetched by using Expert_ID(s) from

relation ExpertMaster [Figure 2.7].

Retrieve Expert_ID *from SubTopicExpert*
Where SubTopic_ID = "   "

Retrieve Expert_Details *from* ExpertMaster
Where Expert_ID = "   "

2.2.9   Contacting Experts

Contact details of experts, fetched from the relation ExpertMaster, are utilized for communication. Email is used as the primary mode of communication. Documents for review are mailed to the experts.

Once the expert(s) are located for the Web Site/Document, the evaluation & rating process begins. To evaluate the Web Site/Document there are certain pre-defined standard parameters. Relevancy is given the utmost importance. A document gets higher rating in the evaluation if its content has higher relevancy to its title. A Web Site/Document confirming to all evaluation parameter will have a high rating. Evaluation is based on blend of objective and subjective parameters and rating given to a Web Site/Document depends on the expert(s), who evaluate the document.

3.1   Evaluation Parameters

Experts do the evaluation of Web Site/Document. Every page of the Web Site/Document is evaluated and a quality Index is given for each parameter [Table 3.1].

There are four quality levels and four quality indices:

Quality Level	Quality Index
Very Good	4
Good	3
Average	2
Poor	1

Table 3.1: Quality Level and Quality Indices

A team of experts may rate a web document at any of the four-quality level. An Experts' Rating Form is used for rating the evaluated documented [Table 3.3]. Only quality levels are to be filled up by expert for each parameter, form itself gives the rating of the document. This rating calculation is pre-programmed where all the Quality Indices are multiplied by their respective weight and summed up to give the over-all rating.

A sample web document is shown in Appendix C-1. Quality indices are given to various parameters in this document to explain the rating system [Table 3.2]. Following quality indices are given to various parameters:

Parameter	Quality Index	Comment
Content		
Relevance to Title	2	Content - Title relevance is low at this page (only references and links)
Soundness and Validity of Contents	2	Content is not about diesel engine working
Self Contained	1	No, things referred to next page
Language		
Spelling & Grammar	3	Good
Linguistic Quality	2	Average
Keywords	1	Keywords usage is low
Presentation		
Organization	4	Yes, categorized details
Illustration	1	No, Illustrations
Formatting	2	Average
Miscellaneous		
Advertisements	1	Advertisement completely irrelevant
Ease of Navigation	3	Yes
Author's Details	4	Yes
Downloading Speed	2	Slow
Links are working properly	4	Yes
Multimedia Contribution	2	Low
Sponsor of the site is Mentioned	2	Yes. But no details
Last Revision Date	1	No
Additional Info	3	Search utility is provided

4-Very Good, 3-Good, 2-Average, 1-Poor

Table 3.2: Quality Indices Given to Various Parameters

The rating of the document is computed by using the Experts' Rating Form.

3.2 Rating

A document is rated at the base of 100. Each evaluation parameter is given a weight, called *parameter weight* [Table 3.3]. This parameter weight is an indication of importance given to respective parameters in a document. Parameter weights were

collected through a survey, conducted among students. Quality indices given by expert are multiplied with parameter weight. This gives the score obtained by the document for a particular parameter. Grand total of score, obtained for all parameter gives the rating of document [Table 3.3].

Experts' Rating Form				
Parameters	Quality Index (QI)	Parameter Weight (PW)	Max Score (PW*4)	Obtained Score (QI*PW)
Content				
Relevance to Title	2	24%	0.96	0.48
Soundness and Validity of Contents	2	10%	0.4	0.2
Self Contained	1	10%	0.4	0.1
Language				
Spelling & Grammar	3	5%	0.2	0.15
Linguistic Quality	2	4%	0.16	0.08
Keywords	1	4%	0.16	0.04
Presentation				
Organization	4	4%	0.16	0.16
Illustration	1	4%	0.16	0.04
Formatting	2	4%	0.16	0.08
Miscellaneous				
Advertisements	1	10%	0.42	0.10
Ease of Navigation	3	4%	0.16	0.12
Author's Details	4	4%	0.16	0.16
Downloading Speed	2	3%	0.12	0.06
Links are working properly	4	3%	0.12	0.12
Multimedia Contribution	2	3%	0.12	0.06
Last Revision Date	1	2%	0.08	0.02
Additional Info	3	2%	0.08	0.06
		100%	4	
Rating Score (RS)				2.03
Rating (RS X 100 / 4)%				

Rating computed in this example is ~ 51 %.

Table 3.3: Quality Indices Given to Various Parameters

3.3   Certification

When the rating of Web Site/Document is completed, a *certification logo* is attached

at every document. This logo contains the certification mark and Rating. Certification given is document specific and not to be used for a document other than the certified.

There are certain terms and condition which should be followed to keep the certification valid. Each certification will have a date of review, date of expiry. At first instance the certification is granted for one year. This is because the content of a web document is less prone to time-bound update. When the certification get expired a new request should be made to renew the certification.

Clients are required to inform any change made in the document. If changes are found in surveillance audit than certification may be seized.

3.4   Logo

A logo is issued to every certified document. Certification logo comprises of Crtification_ID and rating. A small application is used to build up the logo. Inputs to this application are the web document, Certification_ID and its rating. Application automatically generates the appropriate logo in the form of html code [Appendix D].
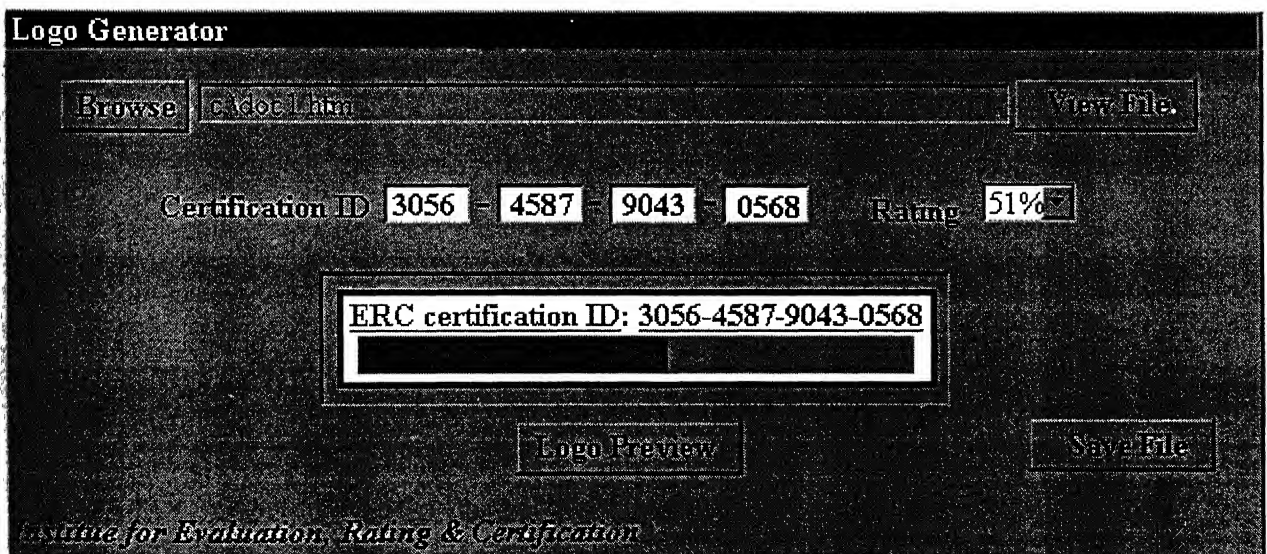
Figure 3.1: Application, Logo Generator

This logo code is added at the beginning of the source code of the web document [Appendix E].

URL embedded in logo leads to certification information web page where its

authenticity may be checked.

3.5   Updating Database

When the certificates are issued to Web Site/Document the database is updated. Document details, certification details, expert details are filled in the database. Expert-part of database is modified with the contact details and sub topic of owner so that he/she may be contacted for review of a similar document.

A certification information page at IERC web site, containing information about the certified documents is also updated.

3.6   Adding to Web Directory

Certified web documents are added to the IERC web directory where IERC-certified pages have categorized listing. Categories available at IERC web directories are maintained in similar hierarchy they are in document database. This helps IERC in maintaining the web directory of certified documents in a natural way. *Area* of web documents is the parent directory, *topic* and *sub topic* are the child directories. An IERC certified web document can be located by following the top-down approach [Figure 3.2].

Figure 3.2: Web Directory, Hierarchy

3.7　Search engines

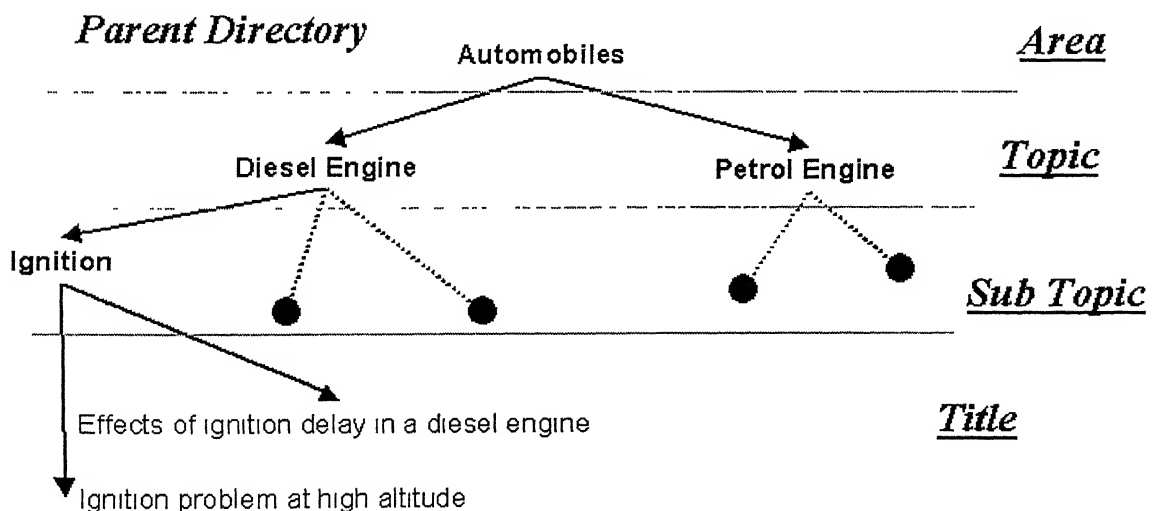While relevancy is the most important "feature" a search engine should offer, most of the search engines sadly remain silent on this issue. Whenever a search is made, the result produces a mega-list of web pages. Most efficient search engine gives the highest matches with no consideration to quality. Few search engines rate the search result, basis of this search rating is an algorithm. All major search engines follow the general rule below:

Location, Location, Location...and Frequency [3]

One of the main rules in a ranking algorithm involves the location and frequency of keywords on a web page. Search engines will also check to see if the search keywords appear near the top of a web page, such as in the headline or in the first few paragraphs of text. They assume that any page relevant to the topic will mention those words right from the beginning. Frequency is the other major factor in how search engines determine top listing, those with a higher frequency are listed on top.

IERC & search engines

Crawler-based search engines automatically visit web pages to compile their listings. These search engines run there own program like spider that visits the each host to build the list [4]. This process is called indexing. If spider is able to index the pages with their IERC-rating, then in search results it is likely to have several pages listed, but pages with high ERC-rating can always be considered most relevant. Results with IERC certification or with high ERC rating can be listed at top. [Figure 3.3]

A spider program has to look for ERC *certification logo code* [Appendix D] written at the top of the web page, during indexing. Whenever a search request is made the query program running at search engine server should compose the result with the web site/document at top that comprise ERC certification logo.

WWW

Spider program running

Crawler Server

DATABASE

Indexed Web Pages

Search Query program running

Search?

Search Server

RESULTS
Web pages with *IERC certification*, listed at top
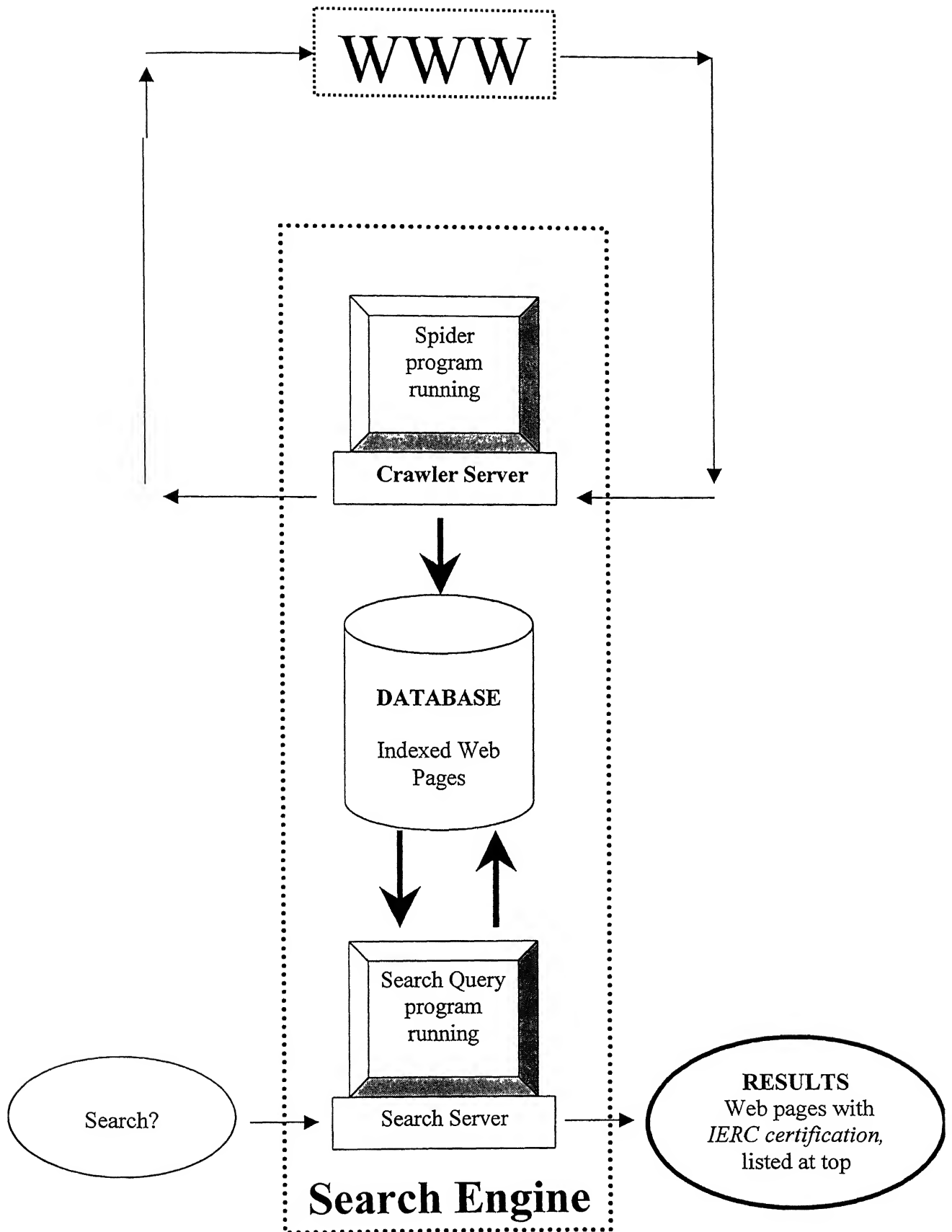
Search Engine

Figure 3.3: Search Engine & IERC

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To bring IERC into existence it requires web connectivity, hardware setup and software in addition to office space, staffing etc as infrastructure.

4.1 Hardware setup

Hardware requirements for Evaluation, Rating and Certification depend on the type of processing involved, amount of computation and storage size for Web Site/Document. The prime needs include computer systems and web connectivity.

4.1.1 Web connectivity

To connect IERC to web, there are two types of connection available:

Leased Line/Dedicated Connection

Dial up Connection

<u>Leased Line/Dedicated connection</u>:

Leased Line Access is a data line that has been leased for private use. In some contexts called a dedicated line, which is continuously in place. It is ideal for client who requires frequent Internet access for searches, downloading and uploading *high volume of data* or other Internet-based services. This type of connection is suitable for organization involved in e-business, requiring high data transfer rate [5].

This type of connection is very costly and its acquisition depends upon data transfer rate requirements.

<u>Dial up connection</u>:

Dial-up Access is the basic method to access Internet, it is a telephone connection in a system of many lines shared by many users. It is suitable for users who access to Internet with low data transfer [6].

This type of connection is cheaper but data transfer rate is also low.

Selection of an option depends on the data transfer rate:

A very optimistic steady rate of 1000 visitors per day may be assumed for the organization web site. If an average visitor browses 10 pages and average web page size is considered as 100 Kilo Bytes then the required data transfer from the IERC web site is:

$$1000*10*100 = 10,00,000 \text{ KB/Day} \ldots\ldots(A)$$

Web documents, submitted to IERC web site also involve data transfer. If the 50 request per day come to the IERC and average web document size is 100 Kilo Bytes then data transfer is:

$$50*100 = 5,000 \text{ KB/Day} \ldots\ldots (B)$$

Browsing the Internet, making emails will also take some portion of available bandwidth. If 1000 pages are browsed each day (Size 100 KB each) and 20 mails are made to experts and web document owners (size 500 KB, may comprise attachments) then the minimum required data transfer is:

$$1000*100 + 20*500 = 1,10,000 \text{ KB/Day} \ldots\ldots (C)$$

Total bandwidth needed is: A + B + C
$$= 10,00,000 + 5,000 + 1,10,000$$
$$= 11,15,000 \text{ KB/Day}$$

The IERC will transfer 1 GB data every day. Since a document is 100 KB, It will take 15 sec. to transfers it at 56 KBPS line. A connection with bandwidth 56 KBPS (used extensively), is fit for IERC needs.

The one time set up cost for dedicated line and annual rent, are very high (up to 2 lac/annum) [7]. Since the bandwidth requirement is quite low, a 56 KBPS **ISDN dialup connection** will be a good choice.

4.1.2 Domain Name Registration

The Domain Name System helps users to find their way around the Internet. Every computer on the Internet has a unique address just like a telephone number. It is called its "IP address" (IP stands for "Internet Protocol").

Translating the name into the IP address is called "resolving the domain name." The goal of the DNS is for any Internet user any place in the world to reach a specific website IP address by entering its domain name. Domain names are also used for reaching e-mail addresses and for other Internet applications [8].

A domain name like *ierc org* is to be registered for hosting the IERC web site.

4.1.3 Database Server – Storage

One dedicated computer system is needed to act as Database Server where all the data and Web Site/Document files will be stored. The hard drive space required is computed as follows:

If the request coming per day for Evaluation, Rating and Certification are 50, which again is a very optimistic number, then net uploaded file size is.

Size of submitted Web Site/Document = 50 * 100 (Document size 100 KB)
$$= 5,000 \text{ KB}$$
Space occupied by submitted documents = 5,000 * 365 KB
$$= 1825 \text{ MB}$$
$$=\sim 2 \text{ GB}$$

Current Internet growth rate is 250%-300% per year. If the same growth rate is assumed for application submission at IERC, then 40 GB hard drive space is sufficient for next few years.

Estimation of database size is also necessary when estimating the hard drive space.

Assumptions:

Possible Areas of Web Site/Document(s) = 9999 (Maximum possible number representation 4 Bytes)

Possible Topic in a particular Area = 9999 (Maximum possible number representation 4 Bytes)

Possible Sub-Topic in a Topic = 9999 (Maximum possible number representation 4 Bytes)

Organization may go for maximum 5 experts of a Sub-Topic. So a SubTopic_ID in the relation SubTopicExpert may have at most 5 Expert_ID(s).

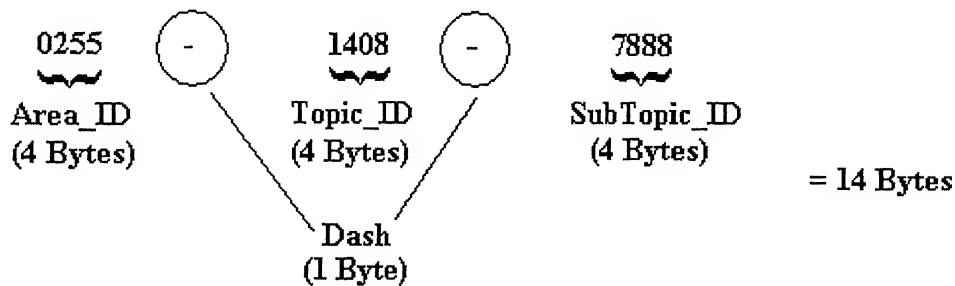Again the bytes assigned for Expert_ID is 14 Bytes.

Figure 4.1: Composition, Expert_ID

In relation DocumentExpert there may be up to 5 Expert_Id(s) for a Document_ID(s).

AreaMaster — 104

Area ID	4
Area_Description	100

TopicMaster — 113

Topic ID	9
Area_ID	4
Topic_Description	100

SubTopicMaster — 123

SubTopic ID	14
Topic_ID	9
SubTopic_Description	100

SubTopicExpert — 28

SubTopic_ID	14
Expert_ID	14

ExpertMaster — 244

Expert ID	14
Expert Name	30
Expert Address	150
Expert Email	50

SiteMaster — 474

Site ID	19
Site Title	100
Site_Description	150
Area_ID	4
Owner	50
IsActive	1
Webmaster_Name	50
Contact_Info	100

DocumentMaster — 746

Document_ID	19
Site_ID	19
Certificate_ID	19
Document_Title	100
SubTopic_ID	14
Authors	100
Creation Date	10
DocumentURL	150
IsActive	1
FileName	50
FileSize	10
LanguageID	4
FolderPath	100
KeyWords	150

DocumentExpert — 33

Document_ID	19
Expert_ID	14

ReviewCycle — 134

ReviewCycleID	24
Description	100
ReviewInterval	10

LanguageMaster — 54

LanguageID	4
LanguageName	50

CertificationMaster — 254

CertificateID	19
Certificate_Title	50
Cewrtificate_Description	100
DateofIssue	10
LatReviewed	10
Rating	3
ReviewCycleID	2
NextReviewDate	10
IssuedTo	50

*All Sizes in Bytes

Figure 4.2: Size of Fields

Now size can be estimated by adding up the entire fields & rows used:

Size of the database:

Searching Tables	
Relation Name	**Row Size**
AreaMaster	104
TopiciMaster	113
SubTopicMaster	123
SubTopicExpert	(28*5)140
DocumentExpert	(33*5)165
Expert Tables	
ExpertMaster	244
Document Tables	
DocumentMaster	748
SiteMaster	474
LanguageMaster	54
CertificationMaster	254
ReviewCycle	134

Table 4.1: Size of Rows

So to record the information of One Web Site/Document, the size of database will increase by 2.5 KB.

Maximum numbers of Web Site/Document(s) that are stored any time are 19,000. Size of database when one Web Site/Document is stored, is = 2.5 KB

Size of database if all the 19000 Web Site/Document(s) are stored = 2.5 * 19,000

$$= 47,500 \text{ KB}$$

$$= 47.5 \text{ MB}$$

The figure 47.5 Mb is quite small and it can be easily dealt with.

So for the database server, hard drive space of = 47.5 GB + 47.5 MB

$$= \sim 50 \text{ GB is sufficient for initial period.}$$

4.1.4   Computer Terminals

Database Server:

All the data related to the Web Site/Document, would be stored in this server and the

33

database applications will also be installed there.

Specifications

IBM NetVista A22p 2292

Processor type: Pentium 4

Memory: 256 MB

Monitor

Hard drive*:   40GB **(2 Nos.)**

Floppy Disk Drive.

Optical device: 48X ROM Drive

Graphics

Audio   (Optional)

Ethernet: (Optional)

Modem   56K

IBM Mouse & Keyboard.

*As the entire database will be stored on the same system, RAID should be used to increase the reliability of server [9].

A disk controller is also needed for RAID

File Server:

A file server is needed to store all the documents submitted to IERC.

Specifications.

Same as Database server.

Proxy/Firewall Server:

One computer terminal is required to act as proxy/firewall server for connecting the local network to Internet

Specifications:

Same as Database server except secondary hard disk and RAID-Disk controller.

Mail Server:

One computer terminal is needed as mail server to send and receive mail at IERC domain name.

Specifications:

Same as Database server except secondary hard disk and RAID-Disk controller.

Workstation:

Minimum Five computer terminal are expected as workstation for IERC routine work.

Specifications

Same as Database server except secondary hard disk and RAID-Disk controller.

Network Infrastructure:

This comprises LAN and supporting hardware like cable plant, bridges etc.

4.2   Software

Operating Systems:

There are several choices available for operating system the most prominent candidates are Windows and Linux, following is a comparison between Windows and Linux [10]:

Hardware cost comparison:

There is no difference in hardware for both the operating systems [Appendix G].

Software Comparison:

Software costs are significantly different and favours LINUX [Appendix G]. Apart form the cost, Linux being the *safe* and *open source*, it is ease to configure, as per the requirements.

Operating System:

Linux Distribution like Red Hat, Mandrake or SuSe will serve as operating System

Database package:

Again there are various Database packages are available. Oracle is most popular one with good security and speed features. Though Oracle is available for Linux operating

system but MySQL is available for free and extensively used on Linux.

Web Server:

Apache web server included with Linux distribution.

Mail Server:

Sendmail or Postfix included with Linux distribution.

Office suite

An office suite is also required comprising word editor, email client, scheduler etc. If Linux is the operating system then Star Office is a good choice, which is compatible to Microsoft's Office.

4.3   Miscellaneous

There are various expenses involved when establishing an organisation. The essentials are hiring staff, acquiring office space etc.

4.3.1   Staffing

Staffing needed to work on Windows platform costs lesser as compared to Linux [11]. But other feature like cheap software applications, more security, open source etc., suppresses the use of windows platform.

Following staff is required to run the institute:

- Managing head to look after the entire organization.
- System administrator is needed to look after the entire software infrastructure.
- Marketing personnel to take care of owners/applicants.
- Personnel for contacting Experts.
- Vigilance staff.

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5.1   Hardware set up

Cost of Internet connectivity:

The cost of 64 KBPS ISDN line[12] = $69.00 month (includes 1 static IP address)

$$= \$69*12 \text{ annually}$$

$$= \$828 \text{ annually}$$

To set up a web and email server a static IP address is required.

To connect IERC to Internet, connection is established by calling ISP, cost of local calls for continuos connectivity [13]= $ 0.024 for 3 minutes.

$$= \$ 0.004 \text{ per minute}$$

$$= \$ 0.004*60*24*365 \text{ per annum}$$

$$= \$ 2102.4 \text{ per annum}$$

Domain Name Registration:

Cost of domain name registration [14]= $ 8.2 per annum

Database server:

$$= \$928 \text{ [15]} + \text{Raid Disk Controller [16]}$$

$$= \$928 + \$300$$

$$= \$1228$$

File Server:

Same as Database server

$$= \$1228$$

Proxy/Firewall Server:

$$= \$928$$

Mail Server:

$$= \$928$$

Workstation:

$$= \$928 * 5 \text{ (5 Nos.)}$$

$$= \$4640$$

Network Infrastructure:

Network Infrastructure is calculated as the cost of equipping one computer, whether it be a workstation or a server, with a connection point on a port or a switch, appropriate cabling and a wall socket, as per current industry best_ practice. Research has shown this turns out to be approximately $100 per computer. Therefore, network infrastructure is calculated as the number of computers multiplied by $100 [11].

$$= \$100 * 9 \text{ (Number of Computers)}$$
$$= \$ 900$$

5.2 Software

Linux Solution Software Cost [17]

Linux Distribution (eg SuSE 7.3)	only 1 copy necessary	$79.95
Apache (Web server)	provided with distribution	$0.00
Squid (Proxy server)	provided with distribution	$0.00
PostgreSQL (Database)	provided with distribution	$0.00
Iptables (Firewall)	provided with distribution	$0.00
Sendmail / Postfix (Mail servers)	provided with distribution	$0.00
KDevelop (IDE)	provided with distribution	$0.00
GIMP (Graphics)	provided with distribution	$0.00
OpenOffice (Productivity suite)	provided with distribution	$0.00
	Total	**$79.95**

[Hardware $ Software prices as on 19/04/2002][15,17]

5.3 Net Cost

Variable Cost:

Internet connectivity	= 828+2102.4	= $2930 per annum
Domain Name Registration		= $8.2 per annum
Total		= **$2940** per annum

Variable cost (for above components) = $2940 per annum

Setup Cost:

Database server	= $1228
File Server	= $1228
Proxy/Firewall Server	= $928
Mail Server	= $928
Workstation	= $4640
Network Infrastructure	= $900
Software	= $79.95
Total	**= $9932**

Setup cost (for above components) = $9932

6.1   Validity of certificate

A certificate will be valid for stipulated time period of one year. Web Site/Document is to be re-evaluated after the expiration of valid date. If date of expiry is near, a reminder is sent to document owner for renewal of certification.

Changes made by owner in a document are to be reported to IERC. A document is reviewed again by IERC if it undergoes changes.

6.2   Forgery

Certification given to a web document can be made void if it is misused. This misuse may be in the form of change in document without informing the IERC. A certificate, issued to non-deserving (giving wrong information) document, will be cancelled as soon as it comes to notice.

6.3   Certificate monitoring/vigilance

After issuance of certificate, sharp vigil is kept on the Web Site/Document. Random and scheduled audits are made to examine the document. Frequency of audits is kept high for initial time period of certification. Just after getting the certification, it is more likely that owner makes changes in the document [Figure 6.1].
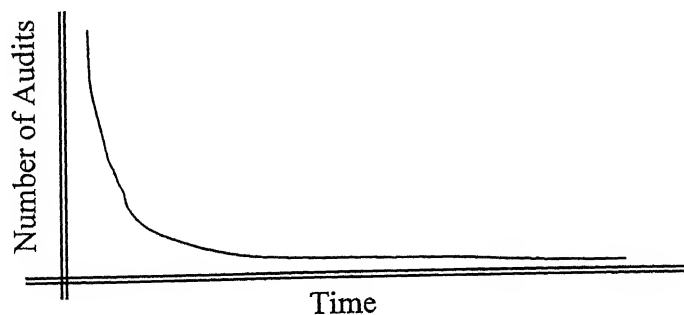

Figure 6.1 Audit Decreases with Time.

If things are found unchanged in first few audits then audit interval is increased and finally only random visits are made.

Hyperlink provided in certification logo leads to the *IERC-certified web documents information page*. Details about Certification like *Certification ID, Title, Rating, Issue Date* etc. can be had form this page [Figure 6.2].
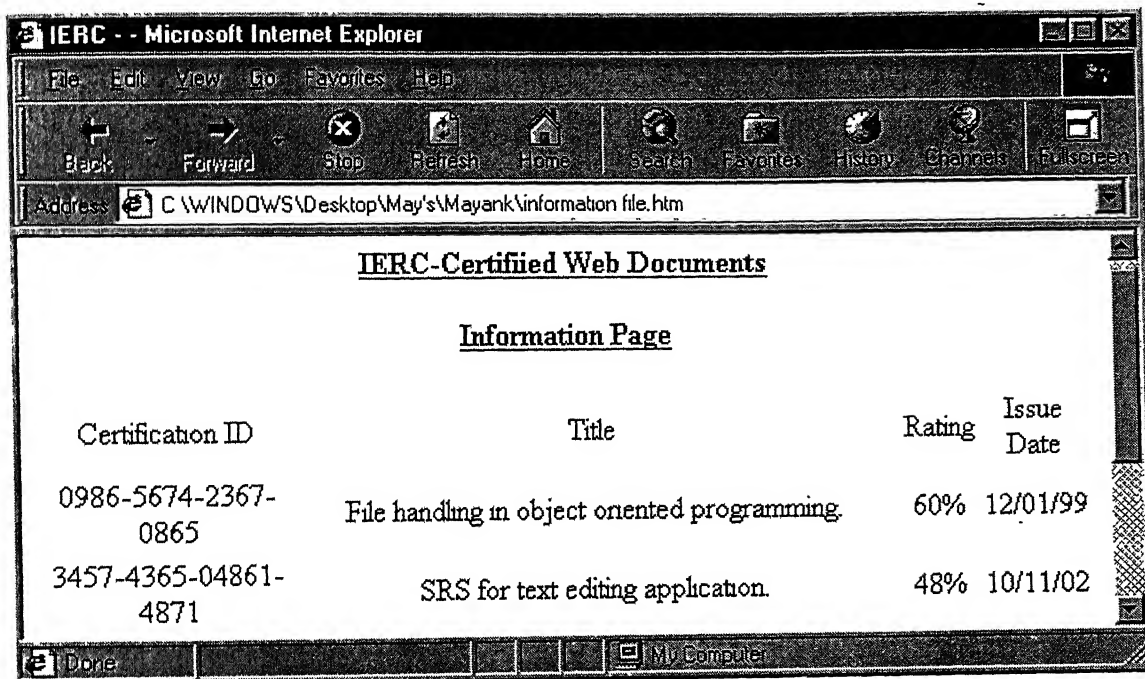

Figure 6.2 IERC, Information Page.

Vigilance activities will be conducted by comparing the publicly available version of the Web Site/Document with the stored Web Site/Document. Comparisons can be made through software [18]. Appendix F shows the comparison of two files. Differences are highlighted by the application. Along with the files comparison, directories comparison is also possible.

If discrepancies are found than action may be taken against the offender, as mentioned in the pre-requisites of Evaluation, Rating & Certification process.

Misuse page

If a person finds that a document is misusing the IERC certification, he/she may report this at the IERC complaint page [Figure 6.3].

Figure 6.3 IERC, Complaint Page.

7.1 Conclusion

In conclusion, this is the first step for evaluation, rating and certification system. Issues discussed were about its necessity, planing, rating system and control. Looking at the scenario, implementation of this system should not take time to establish its credibility. An organization that creates web standards like World Wide Web Consortium may encourage the IERC.

ERC system gives maximum weight to relevancy. Rating gives the quality of document at the base of hundred. Though the parameters are given objective values but rating given by two different experts may conflict due to individual factors. Association of search engines with IERC is sensible step to gather quality and quantity both in search results. Infrastructure needs discussed are specific to IERC. Office space, basic facilities and staffing etc. are considered available. Solution given for hardware requirements is for a small or medium level institution. Requirement may change in near future depending upon the growth. Cost, excluding overheads like office-space and staffing, gives an estimate of expenditure required for developing IERC. Control is the major issues for successful working of IERC. Strong enforcement is required for control policies discussed regarding the certificate-validity, expiry and vigilance.

7.2   Future scope

Basic Frame work is ready for *Evaluation, Rating & Certification of Online Documents*. Few issues are to be dealt in greater depth. System is devised for documents that are static, informative and non-commercial in nature and does not include dynamic content. Membership fee and application fees are to be fixed so that institute can run at least at no-profit no-loss basis. Finally a strict control is needed over certified document. Vigilance demands high technology like digital certificate to keep the track of certified documents.

```
<!DOCTYPE HTML PUBLIC "-//W30//DTD W3 HTML 2.0//EN">
<HTML>
<HEAD>
<!--
Authors:      Cynthia Haynes and Jan Rune Holmevik
Machine:      Jan's Macintosh
Created:      Wednesday, May 15, 1996
Time:         7:22 PM
-->


<TITLE>Organization</TITLE>
</HEAD>
<BODY>

<BODY
BACKGROUND="http://wwwpub.utdallas.edu/~cynthiah/lingua_background.gif">
<TEXT="#000000" LINK="#0000FF" VLINK="#FF0000" ALINK="#FF0000">


<IMG SRC="http://wwwpub.utdallas.edu/~cynthiah/arrow.gif" ALIGN=left>
<FONT SIZE=6>H</FONT><FONT SIZE=5>ow </FONT><FONT
SIZE=6>T</FONT><FONT SIZE=5>his </FONT><FONT
SIZE=6>W</FONT><FONT SIZE=5>eb is </FONT><FONT
SIZE=6>O</FONT><FONT SIZE=5>rganized</FONT><P>
```

This web explores the radical potential of the MOO as a new and dynamic
pedagogical reality, but from the perspective of design and
administration. In essence, the MOO is host to both micro-communities (individual
classes) and macro-communities (research collectives), and the best way to insure the
smooth integration
of all the teaching features with research features is to blur the
boundaries between the two in terms of design and administration.<P>
The links provided through this web will lend support to that aim. Each link sends the
reader to different discussions related to Lingua MOO and writing instruction, to
various points of interest, and specially programmed features at Lingua that enhance
pedagogical methods for writing teachers. Most of the links will allow the reader to
return to the 'start page' though some are external links to outside resources, and a few
take the reader directly to our web interface (in which case, to return to this web you
will need to click on your back button or command your web browser to return
backward). Finally, the web will help redefine the space of learning by weaving
together teaching and research into one seamless pedagogical reality.

```
<P>
<A HREF="http://wwwpub.utdallas.edu/~cynthiah/start.html">
<IMG SRC="http://wwwpub.utdallas.edu/~cynthiah/home.gif" ALIGN=baseline>
Back to the start page</A>
</BODY>
</HTML>
```

mayank_mech@indiatimes.com

INTEREST RATES 𝓢𝓕 Sundaram Home Finance Limited

Inbox   Prev

Delete | Reply | Reply All | Forward As Attachment ▾ | Forward 🖶

Move To | - Selected Folder - ▨

From: info@webratings org   **Block Sender** | **Save Address**
To: <mayank_mech@indiatimes com>
Subject: Your Web Site Rating!
Date: Sat, 15 Feb 2003 17:11 31 -0700
Delete message excluding attachments

Thank you for submitting your web site (http //home.iitk ac in/student/smayanks/) to webratings org,

Our rating board has reviewed your web site and are hereby rating your site as
W-13 (Web Thirteen)

The rating was provided due of the following reason.
Content is suitable for all ages! However contains message boards so some content on boards might no
be suitable for visitors under the age of 13!

You may proudly display your rating seal by using the code below (Just copy/paste)
<!-- Begin Seal Code | www webratings org -->
This website is rated

W-13	**WEB THIRTEEN**
Web site may not be appropriate for children under 13	
www.webratings.org	®

<!-- End Seal Code | www.webratings org -->

If you have any questions, or wish to dispute the rating for any reason, please write to us at
info@webratings org

Once again, thank you for your submission
Have a nice day!

The Internet and Web Rating Association
http //www webratings org

Delete | Reply | Reply All | Forward As Attachment ▾ | Forward 🖶

Move To | - Selected Folder - ▨

Howstuffworks "How Diesel Engines Work" - Microsoft Internet Explorer

http://www.howstuffworks.com/diesel.htm

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For a Free Online
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home | Search | go

ComputerStuff | AutoStuff | ElectronicsStuff | ScienceStuff | HomeStuff | EntertainmentStuff | MoneyStuff | TravelStuff | PeopleStuff

Categories
> Cutting Edge
> Options and Accessories
> Safety
> ShortStuff
> Under the Hood
> Browse the Auto Library

Top Subjects
> Automatic Transmissions
> Car Engines
> Fuel Cells
> Manual Transmissions
> Turbochargers

Sponsored By.

New Detroit Diesel Parts
New Aftermark
OEM parts for
Detroit Diesel
Cummins engi

Diesel Specialists, L
Leading
Distributor/Exc
of DDC Parts,
Subassemblie
and Engines

Explore Stuff
> Big List of Articles
> Browse the Classifieds
> Get the Newsletter
> Shop or Compare Prices
> Search Google
> Forums - Share Your
  Thoughts!

Main > Auto > **Under the Hood**

How Diesel Engines Work

by Marshall Brain

printable version

> Introduction to How Diesel Engines Work
> The Diesel Cycle
> Diesel Fuel
> Lots More Information!
> Shop or Compare Prices

One of the most popular HowStuffWorks articles is How Car Engines Work, which explains the basic principles behind internal combustion, discusses the four-stroke cycle and talks about all of the subsystems that help your car's engine to do its job One of the most common questions asked (and one of the most frequent suggestions made in the suggestion box) is, "What is the difference between a gasoline and a diesel engine?"

If you haven't already done so, you'll probably want to read How Car Engines Work first, to get a feel for the basics of internal combustion But hurry back! In this edition of **HowStuffWorks**, we're going to unlock the secrets of the diesel!

Next Page >>

⌂ HSW Home

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> Introduction to How Diesel Engines Work
> The Diesel Cycle
> Diesel Fuel
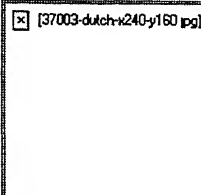> Lots More Information!
> Shop or Compare Prices

Rate this Article!

WORK & LIVE IN AUSTRALIA

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For a Free Online
Visa Assessment

```
Diesel Engine: How it works. - Microsoft Internet Explorer
Back  Forward  Stop  Refresh  Home  ...  ...  ...  ...  ...  ...  ...
Address  http://www.lexcie.zetnet.co.uk/oil-diesel.htm
```

Diesel Engine: How it works.

Originally by _Oliver Keating_, heavily modified and enhanced by _Lexcie_

[37003-dutch-x240-y160.jpg]

Above The class 37 was one of the first diesels in Britain, and is still used for freight (and occasionally passenger) haulage today.

Why was diesel engine developed? Diesel engines came about to replace steam. Even though the original _British Rail Modernisation Plan_ of 1954 specified that electric trains (which already existed on the former _Southern Railway_ in the form of 3rd-rail D C electrification) should replace steam directly, because of the amount of bureaucracy involved –BR was a large organisation, and still bureaucratic to this day- meant that diesels were needed as a stop-gap measure before the money could be found to electrify all the tracks. The decision to phase out steam had been a political one, to give an illusion of development. In actual fact steam locomotives were fine examples of industrial machines. They were reliable even with the minimum maintenance, and when kept in pristine condition they performed well. The relative sophistication of a diesel locomotive in fact posed an operational handicap: better maintenance facility was needed in order to ensure reliable operation, and as a result of the additional equipments needed, the early diesels were relatively low in power output, with the class 40 at 2,000hp almost at the top of the range whilst large, powerful express passenger steam locomotives routinely produced 2,500hp or more. Indeed in the early years diesels were often called in pairs to haul trains which previously just one steam locomotive would have had no problem handling.

The 'Diesel advantage'. One of the many advantages they offered over steam, even in their early years, is that they were very much more fuel efficient, and less polluting, since they do not churn out a large amount of smog-causing soot. They also offered better working conditions for the engine crew. No more was the tunnel a locoman's nightmare, instead of driving practically blind through the dark with smoke filling the driving cab, the motormen now enjoyed clean, closed cabs without all the smoke and the dust, and had small lights to illuminate the line ahead. The 'upgrade' was not welcomed by all engine crew. To run a passenger steam express at 80mph and keep it at that speed require real skill from both the driver and the fireman, but the same is relatively easy to do in a diesel. It also meant that the fireman's job became redundant and they became 'secondmen' on diesel-hauled trains, to simply assist the driver since the driver's absolute attention to the the signal ahead is becoming more vital as train speeds are pushed higher and higher. Interestingly, in the States they were never re-named as secondman, as a result the dubious practice of carrying a 'fireman' on diesel trains persists until today, even though the job description has changed somewhat, the 'fireman' is more like a diesel mechanic.

It is wrong to think that in the early days diesels were more powerful and faster than steam counterparts. This becomes apparent when one examines the world speed record for a diesel is 148mph, whereas for steam it is 126mph, and the diesel record was set some 50 years later since the LNER's A4 record run; it had the extra half-century in between to develop.

The transmission system. At low speeds diesel engines have very little torque (turning force) and when stopped they have no turning force at all, engines have to be spinning to provide some traction. This presents a technical problem, because if the engine crankshaft was connected directly to the wheels like it is in a steam locomotive, it would not be able to provide any force to accelerate the train from rest. Cars and road vehicles get around this by a gear/clutch system, otherwise known as a mechanical transmission system. The clutch allows the engine to engage stationary wheels without having to slow down, and the gears allows the engine to keep the spinning at sufficient speed to keep the torque up.

Clutch/Gear systems were used for the very first diesel trains around, indeed I have travelled on one and its a very strange experience, just like being on a bus. However the forces involved are much greater on a train than on a road vehicle, and gearboxes couldn't really take it, and caused a lot of friction too, further reducing the efficiency. Besides, diesel engines, being compression-ignited, have a very small margin of optimal spin speed. Efficiency drops off very sharply if the engine runs just slightly faster or slower, unlike petrol-engines which do not have as tight a limitation. But, the speed at which the wheels spin at 5mph differs dramatically from that at 80mph! To build such a gearbox would require perhaps some 15 different gears. Even the best rally-drivers would probably find it extremely difficult to change gears that fast, especially on commuter services where one may not even reach top speed between adjacent stations or signal checks. As any truck driver would know, an articulated lorry has up to 9 gears for a similar reason, in order to keep the engine revs at its optimal value and to make sure enough tractive effort is produced, faced with a wide variety of gradients. Truck-trailers are only permitted to travel at up to 50mph in Britain, if one attempt to build a 100mph diesel locomotive out of mechanical transmission one would soon run into problems. An automatic transmission would be pointless, as the efficiency loss in such a transmission would render the 'diesel advantage' in the early days practically nonexistent.

The electric transmission. The solution was to use an _Electric transmission_. Electric motors have very high torque just when stationary. If you take two electric motors, wire them into each other, then if you turn one of them, the other one will turn. This principle is used in diesel engines, the engine turns one of the motors and the other is connected to the wheel axle. This is an excellent way of transferring the power. The to start the train the engines roar up, spinning the motor very fast. This puts a high potential difference across the axle motor bringing in enough torque to start the train moving off and accelerating

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Organization - Microsoft Internet Explorer

File Edit View Go Favorites Help

Back Forward Stop Refresh Home Search Favorites History Channels Fullscreen Mail Print Edit

Address C:\WINDOWS\Desktop\Bas.htm

How This Web is Organized

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This web explores the radical potential of the MOO as a new and dynamic pedagogical reality, but from the perspective of design and administration. In essence, the MOO is host to both micro-communities (individual classes) and macro-communities (research collectives), and the best way to insure the smooth integration of all the teaching features with research features is to blur the boundaries between the two in terms of design and administration.

The links provided through this web will lend support to that aim. Each link sends the reader to different discussions related to Lingua MOO and writing instruction, to various points of interest, and specially programmed features at Lingua that enhance pedagogical methods for writing teachers. Most of the links will allow the reader to return to the 'start page' though some are external links to outside resources, and a few take the reader directly to our web interface (in which case, to return to this web you will need to click on your back button or command your web browser to return backward). Finally, the web will help redefine the space of learning by weaving together teaching and research into one seamless pedagogical reality.

Back to the start page

My Computer

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File Difference Viewer

C:\WINDOWS\Desktop\1.txt

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 36.     see the section titled "Java 2 Runtime Envi
 37.     Plug-in" in the README.html file.
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This comparison is based on a network of 250 users, all requiring standard office productivity solutions, email, internet services & SQL data access as well as a small number of specialist technical/developer workstations.

Based on a 3 year period, the model aims to mimic the operational life span of most corporate computer systems, and amortise the purchase and installation costs over that period of time. The Hardware Requirements for this Network are outlined below

- 245 x Standard Workstations
- 3 x Developer Workstations
- 2 x Graphics/Design Workstations
- 1 x Mail Server
- 5 x File/Print Server
- 1 x Proxy/Firewall Server
- 1 x Intranet & SQL Server
- 1 x E_ Business Server
- (incl. SQL & Webserver)

	Windows	Linux
HARDWARE		
Workstation	$232,300.00	$232,300.00
Server	$25,837.00	$25,837.00
Network Infrastructure	$25,900.00	$25,900.00
TOTAL Hardware Costs	$284,037.00	$284,037.00
SOFTWARE		
Platform Software	$56,121.00	$79.95
Office Productivity Applicati	$222,397.50	$0.00
Specific Technical Applicati	$4,455.00	$0.00
Total Software Costs	$282,973.50	$79.95
OPERATING COSTS		
Staff Salaries	$345,000.00	$376,500.00
Internet Connectivity	$36,000.00	$36,000.00
Consultancy Fees	$45,000.00	$45,000.00
Miscellaneous	$25,000.00	$25,000.00
TOTAL Operating Costs	$451,000.00	$482,500.00
TOTAL COSTS	$1,018,010.50	$766,616.95
LINUX SAVINGS		$251,393.55
% Total Cost		24.69%

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भारतीय ना...स्था संस्थान कानपुर

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